U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Atlantic Estuarine Fisheries Center
Beaufort, North Carolina 28516

January 19, 1973

Mr. J. P. Stohr, Sr.
Environmental Protection and
Special Programs Section
U.S. Atomic Energy Commission
Directorate of Regulatory Operations
Region I
970 Broad Street
Newark, NJ 07102

Dear Mr. Stohr:

I received your letter of January 16 with the Oyster Creek temperature data attached. I have forwarded a copy to Mr. Paul E. Hamer, Director, N.J. Nacote Creek Research Station, Absecon.

Attached are comments and a narrative account of the Oyster Creek menhaden kill of January 1973, with estimates of the number of dead menhaden. Also attached is a copy of Dr. Wurtz' report of the fish survey of December 27-29, 1972.

Sincerely,

John W. Reintjes
Fishery Biologist

Attachments
As Stated

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Comments Relative to the Oyster Creek Menhaden Kill, January 1973, with Estimates of the Number of Dead Fish.

Dr. Charles B. Wurtz, biological consultant, assisted by Roy E. Younger, is conducting a monthly inventory of fish in the vicinity of Oyster Creek Generating Station. Their December survey was underway December 27-29. At noon on December 28, they met Tom McClusky, plant manager, and he mentioned the planned shut-down. Wurtz advised him to put the dilution pump in operation and come down slowly to minimize gradient shock. Apparently the Station tripped out at 6 a.m. on December 29, so that the planned shut-down was pre-empted. On December 29, the last day of the routine survey, 205 menhaden ranging from 4 to 15 inches (mean 8.6 in) were taken by gillnet in Oyster Creek. They saw several dead juveniles and some adults in apparent distress. Oyster Creek temperatures decreased from 59-60 F to 44-45 F following the plant shutdown at 6:00 a.m. December 29.

Dr. Wurtz learned of the fish kill on January 8 and conducted an on site inspection on January 9. Ice on the Creek and the finger lagoons prevented trawl or gillnet collecting. No dead fish were seen in the main channel area. Dead fish were easily visible through the ice on the lagoons. They estimated 900 dead menhaden in 20,000 square feet. If this were extrapolated for the 4 lagoons with 400,000 square feet, it would give an estimated total of 18,000 dead menhaden. They reported relatively few gulls as compared to the flocks present during the kill of January 1972. The only other fish noticed were 20 Bay anchovies frozen in the ice.

Paul E. Hamer, Director N.J. Division of Fish, Game and Shellfish, Nacote Creek Research Station, Absecon, learned about the shut-down and fish kill on January 8. He sent a crew to Oyster Creek on January 9. The Creek was covered with ice and flocks of gulls were trying to get at the dead fish. They reported menhaden accounted for about 99 percent of the dead fish and they ranged from juveniles to adults, 4 to 14 inches in length. Nearly all of the dead menhaden were in the finger lagoons. They estimated the number of dead fish in the surface ice and cut a hole in the ice and used a bottom grab to sample the bottom. They estimated a total fish kill of 1,200,000 fish. Approximately 23,000 in the surface ice and the remainder on the bottom. Nearly all of the dead fish were Atlantic menhaden.

To explain the large estimated number of dead menhaden on the bottom, he mentioned that most of the dead menhaden were found on the bottom during their survey of Oyster Creek after the January 1972 kill. Menhaden have a relatively small swim bladder and usually do not surface when they are killed.

Mr. Hamer believes they could be very helpful in the proper evaluation of fish kills if they were notified in advance of planned shutdowns or as soon as possible when there is an emergency shutdown.

Paul Hamer mentioned another fish kill, primarily of menhaden, that also occurred during the week of January 8. It took place in a small cove near Harvey Cedars at the lower end of Barnegat Bay. As this is about 12 miles south of Oyster Creek, on the other side of Barnegat Bay, and south of Barnegat Inlet it is quite unlikely the dead fish came from the Oyster Creek area.

I called the Mid-Atlantic Coastal Fisheries Center, Sandy Hook and talked to John Mahoney, a fishery biologist that has been involved with fish-kill studies. He had not been involved with the Oyster Creek menhaden kill but obtained the following information from Mrs. Pawlikowski, Secretary to the Director. No one from MACFC went to Oyster Creek the week of January 8 but several phone calls were made. Persons called were Ed Sherratt, Regional Director of Public Information, Jersey Central Power and Light, Asbury Park; Herbert Fishberg, Newark Star Ledger; and Mr. Mallie, Briarwood Yacht Basin, Oyster Creek. They all confirmed that a fish kill had occurred during the weekend of January 5-8. Mr. Mallie estimated that 6 menhaden per square yard were frozen into the surface ice along the bulkheads of the finger lagoons and 1 menhaden per square yard over the remaining area. He reported menhaden 8 to 10 inches long but added that smaller fish may have been present but would be much harder to see in the ice.

Assuming Mr. Mallie's estimated pertained to the 4 finger lagoons, each 1,000 ft. long and 100 ft. wide, with 6 menhaden in each square yard along the bulkheads and 1 menhaden per square yard in the remaining areas. The estimated total is approximately 58,000 menhaden.

Estimates of dead menhaden in the surface ice roughed from 18,000 to 58,000. There was only one estimate of 1,200,000 for the total number of dead menhaden for both surface and on the bottom by biologists of N. J. Nacote Creek Research Station.

January 19, 1973

John W. Reintjes
Fishery Biologist
Atlantic Estuarine Fisheries Center
Beaufort, North Carolina

GPU SERVICE CORPOR ION
(a subsidiary of General Public Utilities Corporation)
260 Cherry Hill Road
Parsippany, New Jersey 07054/201-539-6111

January 11, 1973

Mr. John W. Reintjes
Fishery Biologist
Atlantic Estuarine Fisheries Center
Beaufort, North Carolina 28516

Dear Mr. Reintjes:

Attached for your information is a copy of the report by Dr. C. B. Wurtz for his field investigation work on December 27-29, 1972.

Yours very truly,

Hugh J. Williams

HJW/ah
Attachment, Report

CHARLES B. WURTZ, Ph. D., *Consulting Biologist*

3220 PENN STREET
PHILADELPHIA, PA. 19129
215-844-7461

JC
JR
WA

4 January 1972

Mr. H. J. Williams
GPU Service Corporation
260 Cherry Hill Road
Parsippany, New Jersey 07054

Dear Mr. Williams:

This letter is the fifth progress report on the menhaden investigations being done in the interests of the Oyster Creek Plant. The field work for this report was done December 27-29, 1972.

During this field period we added another type of fish collecting gear to our procedures; gill nets. Therefore, we are now using three fishing techniques. These are: 1) an otter trawl (referred to in earlier progress reports as a bottom trawl or "standard" trawl), which fishes on the bottom, 2) a modified beam trawl towed between two boats which fishes at the surface, and, 3) monofilament gill nets. The latter, not previously described, consist of four 100-foot lengths of net six feet deep. The nets each have a different mesh size (square measurement), increasing in quarter-inch increments from 3/4 inch to 1 1/2 inch.

Collections this time did not produce any of the blue crabs which were common in the fall. The results from our five stations, identified in the first progress report, are tabulated below.

FISH COLLECTED WITH OTTER TRAWL
December 27-28, 1972

	Stations					
	1	2	3	4	5	Total
Bay anchovy	2		2			4
Fourspine stickleback			52			52
Winter flounder			1			1

FISH COLLECTED WITH BEAM TRAWL
December 27-28, 1972

	Stations					
	1	2	3	4	5	Total
Twospine stickleback					3	3
Fourspine stickleback			1			1
Atlantic silversides	56	94	36	6	24	216
Atlantic menhaden		2				2

CHARLES B. WURTZ, Ph.D., *Consulting Biologist*

FISH COLLECTED IN GILL NETS
December 29, 1972

	1	3	5	Total
White perch	2			2
Spot	3			3
Atlantic menhaden	205			205

The gill nets were not set at Stations 2 and 4, and they did not capture any fish at Stations 3 and 5.

Water temperatures recorded at the time of sampling are presented below. Time is expressed on a 24-hour basis.

FIELD TEMPERATURES (°F)

Station	Date	Time	Measurements
1	27 Dec	1540	Surface 59, Bottom 61
2	27 Dec	1640	Surface 56, Bottom 60
3	28 Dec	0905	Surface 44, Bottom 44
4	28 Dec	1010	Surface 44, Bottom 45
5	27 Dec	1025	Surface 43, Bottom 44
1*	29 Dec*	1624*	Surface 45, Bottom 44

*Plant went down at 0600.

A total of 205 menhaden were taken in the gill nets at Station 1 as presented above. At the time of capture (beginning at 0900 on December 29th) these fish were alive and appeared healthy in all respects. The size-range of these net-caught menhaden varied from four inches to 15 inches in total length. (Smaller menhaden were also seen.) The average length for the total catch was 8.6 inches. We were much surprised to find this size range present, and particularly surprised to find adult fish present. You will recall that in January 1972 the size of the menhaden killed in Oyster Creek was estimated to approximate four to five inches in total length with little deviation from this estimate. Certainly no large menhaden were seen by me or my assistant and no reports of larger specimens have come to my attention.

The data presented by Reintjes (p. 10) in his Final Report indicate that a population of menhaden larvae acclimated at 15°C (59°F) will suffer 50 percent mortality in 82.8 hours when subjected to 7°C (44.6°F). These temperature conditions closely approximate those prevailing in Oyster Creek at Station 1 on December 29th; the plant having been taken down at 0600 on that date.

At the moment we have no knowledge of the effect of the above temperature changes on menhaden larger than the larvae (ca. one inch). However, at the time of our gill netting operation at Station 1 we found three dead menhaden on the bottom of the canal that were two to three inches in length. In addition, about six large (est. 12 inches) menhaden were observed swimmin erratically at the surface of the canal. Apparently these fish had lost locomotive control, which apparently is one of the symptoms of chilling to stress temperatures.

As of 1100 the morning of January 3rd there was no report of dead fish in the Oyster Creek Canal and no complaints. However, no one from the Plant had gone to the canal to specifically investigate this possibility.

I am forwarding this report at this time because I feel that continuing check should be kept on the Oyster Creek discharge canal through the down period and for a day or so after start-up. My invoice, which is not yet prepared, will follow.

If you have any questions I would be happy to respond to them.

Sincerely yours,

Charles B. Wurtz

Charles B. Wurtz